

REMARKS

This amendment, submitted in response to the Office Action dated July 3, 2002, is believed to be fully responsive to each point of rejection raised therein.

As a preliminary matter, the Examiner objects to the title and claims for containing informalities. Applicant has amended the title and claims as set forth above. The additional amendments also make explicit what was previously implicit in the claims. No change of scope is effected.

Turning to the merits of the Office Action, claim 1 has been rejected under the statutory type double patenting rejection as claiming the same subject matter as claim 1 of co-pending U.S. Appln. No. 09/844,276. Applicant has reviewed claim 1 of the co-pending case, and the rejection does not appear to be warranted. Specifically, claim 1 of the co-pending application 09/844,276 describes “a moisture content-controlling section, upstream of the thermal developing section, which controls moisture content of the light and heat sensitive recording material after exposure.” This feature is not included in claim 1 of the present application. The Examiner’s own precedent indicates that a Section 101 rejection for statutory double patenting requires the inventions to be drawn to identical subject matter. Since claim 1 of the present case is not identical to claim 1 of Appln. No. 09/844,276, the statutory double patenting rejection is improper. In re Goodman, 29 USPQ2d 2010, 2015-16 (Fed. Cir. 1993). Therefore, Applicant would request that the statutory double-patenting rejection be withdrawn.

Claims 1-5 and 7-16 have been rejected under 35 U.S.C. § 103 as being unpatentable over Kubo et al. (U.S.P. 6,303,259, hereafter “Kubo”) in view of Mizutani et al. (U.S.P. 4,734,704, hereafter “Mizutani”). Claim 6 has been rejected under 35 U.S.C. § 103 as being

unpatentable over Kubo and Mizutani and further in view of Katoh et al. (U.S.P. 6,395,466, hereafter "Katoh"). Applicant submits the following arguments in traversal of the prior art rejections.

Applicant's invention relates to an apparatus that provides image production without generating waste products. Fig. 1 illustrates an exemplary embodiment including a casing 14, an optical recording section 16 for forming a latent image using visible light, a thermal developing section 18, and an optical fixing section 20. In an exemplary light and heat sensitive recording layer, a photo-polymerizable composition outside a thermally responsive microcapsule (encapsulating a colorant A) polymerizes and is cured to form a latent image. Subsequent heating causes a (colorless) compound B present in unexposed portions to move within a recording material, and reacts with the color-forming component A within the capsules to form a color. A fixing light can be used to fix the image.

Turning to the cited art, Kubo relates generally to a heat and light sensitive recording material and recording method. The fixation in Kubo is provided with a UV lamp. While the reference discloses various encapsulations of colorants, couplers and resin shells, the Examiner correctly recognizes that Kubo does not teach any single apparatus for processing the medium.

Mizutani relates to a thermal recording apparatus. In this connection, several thermal heads 21-23 record an image onto a heat sensitive recording medium which subsequently undergoes thermal developing. The object of the reference is to provide multiple levels of temperature thresholds to provide a color output without color blur due to the presence of different hues in an image. Col. 11, lines 13-54.

The Examiner concedes that Kubo does not teach the physical sections of a printing apparatus but cites Mizutani to make up for this deficiency. The rejection is not supported for at least the following reasons.

First, Kubo and Mizutani relate to fundamentally different types of recording. Mizutani clearly describes a thermal recording apparatus, and Kubo relates to a heat and light-sensitive material and fixation with UV light. By definition, different types of energy are used to record images in each reference. There is clearly no reason to combine aspects of Kubo and Mizutani in view of this fundamental difference.

Second, even assuming *arguendo* that one skilled in the art would combine Kubo and Mizutani, their combination does not teach each feature of claim 1. Claim 1 specifically describes using optical recording to record a latent image. By contrast, Mizutani clearly describes several recording heads 21-23 for thermal recording. Col. 11, lines 13-15. Therefore, claim 1 is patentable for at least these reasons. The Examiner had previously conceded that Kubo does not teach the physical structures of the printing system and thus does not teach the arrangement of claim 1.

Because claim 12 includes features similar to that described in claim 1, claim 12 is patentable for the reasons set forth above. The remaining claims 2-11 and 13-16 are patentable based on their dependency.

With further regard to claims 3 and 5, these claims describe characteristics for recording energy and illumination of a fixing light, respectively. The Examiner maintains that these features would be the result of routine experimentation. However, only results-effective

variables may be optimized. Since many characteristics can be adjusted in the image reproduction process, ranging from the wavelength of recording light to type of colorant and polymerizing materials, there is no suggestion that the physical components described in claims 3 and 5 should be singled out for optimization. The features of claims 3 and 5 make it possible to provide a small and high speed imaging apparatus that produces a stable output. Therefore, the Examiner's rationale for the rejection lacks support for claims 3 and 5 for this additional reason.

With further regard to claims 13-16, these claims describe physical aspects of the optical recording. Because Mizutani fails to include optical recording in even the general sense, there is no teaching for the further specific aspects of optical recording described in claims 13-16. The Examiner has failed to indicate where Kubo teaches the features of these claims.

With further regard to claim 6, the Examiner concedes that the combination of Kubo and Mizutani do not teach the temperature tolerances of this claim. The Examiner cites Katoh to make up for this deficiency. However, Applicant would point out that Katoh only qualifies as prior art by virtue of its earlier U.S. filing date, and is commonly assigned with the present application. Therefore, Katoh may be removed as a reference by demonstrating that common obligation of assignment. In this connection, Applicant notes that the assignment of Katoh to Fuji Photo Film, Co., Ltd. was recorded on August 31, 2000 at Reel 011085, Frame 0210. The assignment of the present application to the same assignee was recorded on May 1, 2001 at Reel 011754, Frame 0611. Applicant submits appropriate documents in traversal of this rejection. Therefore, claim 6 is allowable for at least this reason. Should any new rejection be applied against claim 6, it must be made on a non-final basis.

AMENDMENT UNDER 37 C.F.R. § 1.111
U.S. Appln. No. 09/845,322


Applicant has added claims 17-18 to describe additional features of the invention.

In view of the above, Applicant submits that claims 1-18 are in condition for allowance. Therefore it is respectfully requested that the subject application be passed to issue at the earliest possible time. The Examiner is requested to contact the undersigned at the local telephone number listed below to discuss any other changes deemed necessary.

The USPTO is directed and authorized to charge all required fees, except for the Issue Fee and the Publication Fee, to Deposit Account No. 19-4880. Please also credit any overpayments to said Deposit Account.

Respectfully submitted,

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Date: December 3, 2002

APPENDIX
VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE TITLE:

The title is changed as follows:

LIGHT AND THERMAL ENERGY IMAGE-RECORDING APPARATUS

IN THE CLAIMS:

The claims are amended as follows:

1. An image-recording apparatus comprising:

a casing section which encases a light and heat sensitive recording material;

an optical recording section, downstream of the casing section, which exposes the light and heat sensitive recording material to visible light, which has been fed from the casing section, for recording a latent image;

a thermal developing section, downstream of the optical recording section, which develops the latent image by heating; and

an optical fixing section, downstream of the thermal developing section, which irradiates visible light for fixing a developed image.

9 (Amended). The image-recording apparatus as claimed in claim 1, wherein the light and heat sensitive recording material is provided with a light and heat sensitive recording layer containing:

a substantially colorless compound C that is encapsulated in heat-responsive microcapsules and is capable of reacting with a color-forming component A to form color; and

a photo-polymerizable composition outside the heat-responsive microcapsules, the photo-polymerizable composition including at least [the] a color-forming component A, a photo-polymerizable compound D, and a photo-polymerization initiator.

12. An image-recording apparatus comprising:

a casing section which encases light and heat sensitive recording material;

an optical recording section, downstream of the casing section, which exposes, using at least a short wavelength light source that has an intensity maximum in a wavelength range of 300 to 450 nm, the light and heat sensitive recording material, which has been fed from the casing section, for recording a latent image;

a thermal developing section, downstream of the optical recording section, which develops the latent image by heating; and

an optical fixing section, downstream of the thermal developing section, which irradiated visible light for fixing a developed image.